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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,160

06/04/2007

Carsten Butz

011235.58057US

6951

23911 7590 05/05/2011
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EXAMINER

ELLIS, RYAN H

ART UNIT

PAPER NUMBER

3745

MAIL DATE

DELIVERY MODE

05/05/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,160	Applicant(s) BUTZ ET AL.	
	Examiner RYAN H. ELLIS	Art Unit 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-20, 22, 23 and 25-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20, 30 and 31 is/are allowed.
- 6) ☒ Claim(s) 12-19, 22, 23 and 25-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2011 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Drafts, Person's Patent Drawing, Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 3/22/2011, with respect to the rejections of claims 20, 30 and 31 have been fully considered and are persuasive. The rejections of claims 20, 30 and 31 have been withdrawn and the claims are now allowed.
2. Applicant's arguments, filed 3/22/2011, with respect to the 112 rejections of claims 13 and 21 have been fully considered and are persuasive. The rejections of claims 13 and 21 have been withdrawn.
3. Applicant's arguments, filed 3/22/2011, with respect to the drawing objections have been fully considered and are persuasive. The objection to the drawings has been withdrawn.
4. Applicant's arguments filed 3/22/2011 with respect to the remaining claims have been fully considered but they are not persuasive.
5. With respect to Applicant's arguments that the combination of Clouse and Schilling does not teach a flat metal sheet the examiner respectfully disagrees. The examiner is using the Schilling reference to disclose a flat sheet shape for a spring. There is not mention of combining the hooks of Schilling with Clouse and if the shape of Schilling was applied to the spring of Clouse the spring would attain the correct shape. Additionally Clouse mentions that the shape of their spring is an improvement in weight and machining (col. 1, ll. 30-40) which are traits that a flat metal sheet would share. Therefore Clouse is not teaching away from the combination.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 12-15, 22, 23, 25 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 7,291,946 to Clouse et al. (Clouse) in view of US Patent No. 6,139,264 to Schilling.

In Reference to Claim 12

Clouse teaches:

A damping arrangement for guide vanes, in particular for guide vanes (151) of a gas turbine or an aircraft engine, wherein radially external ends of the guide vanes of a guide vane grid or a guide vane ring are mounted to a housing (platform 153), wherein radially internal ends of the guide vanes form an inner shroud (platform 155), wherein at least one seal bearing (seal 157) is mounted to the inner shroud of the guide vanes, and wherein at least one spring element (damper 161) is installed between the inner shroud of the guide vanes and the, or each, seal bearing, and wherein the, or each, spring element is configured as a leaf spring (Figure 6).

Clouse fails to teach:

Wherein the leaf spring is a flat metal sheet and wherein the flat metal sheet engages with the inner shroud and the seal bearing to deform the leaf spring.

Schilling teaches:

Wherein the leaf spring (32) is a flat metal sheet and wherein the flat metal sheet engages with the inner shroud and the seal bearing to deform the leaf spring (Figure 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the spring of Clouse as a flat metal sheet as taught by Schilling for the purpose of decreasing the looseness in the assembly (col. 3, ll. 37-47). If the shape taught by Schilling is applied to Clouse's spring the same forces that are held by the hooks would be held by the shroud of Clouse.

In Reference to Claim 13

Clouse as modified by Schilling teaches:

The damping arrangement according to Claim 12 (see rejection of claim 12 above), wherein the, or each, spring element configured as a leaf spring (damper 161) is installed in a hollow space (cavity 159) (Figure 6) and defined between the inner shroud of the guide vanes and the, or each, seal bearing.

In Reference to Claim 14

Clouse as modified by Schilling teaches:

The damping arrangement according to Claim 12 (see rejection of claim 12 above), wherein the, or each, spring element configured as a leaf spring (161)

is clamped between the inner shroud (155) of the guide vanes and the, or each, seal bearing (157).

In Reference to Claim 15

Clouse as modified by Schilling teaches:

The damping arrangement according to Claim 14 (see rejection of claim 14 above), wherein the, or each, spring element (161) configured as a leaf spring is clamped between the inner shroud (155) of the guide vanes and the, or each, seal bearing (157) such that a central abutment section of the leaf spring abuts against the, or each, seal bearing, and a first and a second lateral abutment section of the leaf spring abut against the inner shroud of the guide vanes (Figure 6).

In Reference to Claim 22

Clouse as modified by Schilling teaches:

The damping arrangement according to Claim 12 (see rejection of claim 12 above), wherein the, or each, spring element configured as a leaf spring (161) comprises a plurality of leaf spring sections separated from each other by slits (slots 175), wherein each inner shroud of each guide vane is associated, respectively, with a one of the leaf spring sections.

In Reference to Claim 23

Clouse teaches:

A damping arrangement for a guide vane (151) of a gas turbine engine, comprising: a guide vane, wherein a radially internal end of the guide vane forms

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an inner shroud (155); a seal bearing (157) mounted to the inner shroud of the guide vane; and a spring element (161) disposed between the inner shroud and the seal bearing, wherein the spring element is a leaf spring (Figure 6).

Clouse fails to teach:

Wherein the leaf spring is a flat metal sheet and wherein the flat metal sheet engages with the inner shroud and the seal bearing to deform the leaf spring.

Schilling teaches:

Wherein the leaf spring (32) is a flat metal sheet and wherein the flat metal sheet engages with the inner shroud and the seal bearing to deform the leaf spring (Figure 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the spring of Clouse as a flat metal sheet as taught by Schilling for the purpose of decreasing the looseness in the assembly (col. 3, ll. 37-47). If the shape taught by Schilling is applied to Clouse's spring the same forces that are held by the hooks would be held by the shroud of Clouse.

In Reference to Claim 25

Clouse as modified by Schilling teaches:

The damping arrangement according to Claim 24 (see rejection of claim 14 above), wherein the, or each, spring element (161) configured as a leaf spring is clamped between the inner shroud (155) of the guide vanes and the, or each, seal bearing (157) such that a central abutment section of the leaf spring abuts

against the, or each, seal bearing, and a first and a second lateral abutment section of the leaf spring abut against the inner shroud of the guide vanes (Figure 6).

In Reference to Claim 27

Clouse teaches:

A damping arrangement for a guide vane ring of a gas turbine engine, comprising: a guide vane (151) ring including a first and a second guide vane, wherein a radially internal end of each of the first and second guide vanes forms an inner shroud (155); a seal bearing (157) mounted to the inner shrouds of the first and second guide vanes; and a spring element (161) disposed between the inner shrouds and the seal bearing, wherein the spring element is a leaf spring (Figure 6).

Clouse fails to teach:

Wherein the leaf spring is a flat metal sheet and wherein the flat metal sheet engages with the inner shroud and the seal bearing to deform the leaf spring.

Schilling teaches:

Wherein the leaf spring (32) is a flat metal sheet and wherein the flat metal sheet engages with the inner shroud and the seal bearing to deform the leaf spring (Figure 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the spring of Clouse as a flat metal sheet as taught by Schilling for the purpose of decreasing the looseness in

the assembly (col. 3, ll. 37-47). If the shape taught by Schilling is applied to Clouse's spring the same forces that are held by the hooks would be held by the shroud of Clouse.

In Reference to Claim 28

Clouse as modified by Schilling teaches:

The damping arrangement according to Claim 27 (see rejection of claim 27 above), wherein the leaf spring includes a first section and a second section (Figure 7), wherein the first section and the second section define a slit (slot 175) between the first and second sections.

In Reference to Claim 29

Clouse as modified by Schilling teaches:

The damping arrangement according to Claim 28 (see rejection of claim 28 above), wherein the first section of the leaf spring (161) is disposed between the inner shroud (155) of the first guide vane and the seal bearing (157) and wherein the second section of the leaf spring is disposed between the inner shroud of the second guide vane and the seal bearing (Figure 6). Both sections are between the two.

8. Claims 16 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 7,291,946 to Clouse et al. (Clouse) in view of US Patent No. 6,139,264 to Schilling and in further view of an engineering expedient.

In Reference to Claim 16

Clouse as modified by Schilling teaches all of the following except:

Wherein the, or each, spring element configured as a leaf spring is clamped between the inner shroud of the guide vanes and the, or each, seal bearing such that a central abutment section of the leaf spring abuts against the inner shroud of the guide vanes, and a first and a second lateral abutment section of the leaf spring abut against the, or each, seal bearing.

An engineer in the turbine art would have considered flipping the spring as a routine engineering expedient so that the middle abuts the inner shroud because the forces are the same in either orientation and it is obvious to but the spring in either orientation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the orientation of the spring of Clouse so that the middle abuts the inner shroud as an engineering expedient because the forces are the same and it is obvious to place the spring in either orientation.

In Reference to Claim 26

Clouse as modified by Schilling teaches all of the following except:

Wherein a central abutment section of the deformed leaf spring engages with the inner shroud and extends in a radially inner direction and wherein a first and a second lateral abutment section of the deformed leaf spring engage with the seal bearing and extend in a radially outer direction.

An engineer in the turbine art would have considered flipping the spring as a routine engineering expedient so that the middle abuts the inner shroud because the forces are the same in either orientation and it is obvious to but the spring in either orientation. It would have been obvious to one having ordinary skill in the art at the time the invention

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was made to modify the orientation of the spring of Clouse so that the middle abuts the inner shroud as an engineering expedient because the forces are the same and it is obvious to place the spring in either orientation.

9. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 7,291,946 to Clouse et al. (Clouse) in view of US Patent No. 6,139,264 to Schilling and in further view of US Patent No. 5,601,407 to Humhauser.

In Reference to Claim 17

Clouse as modified by Schilling teaches:

The damping arrangement according to Claim 12 (see rejection of claim 12 above), wherein between the inner shroud (155) of the guide vanes and the, or each, seal bearing (157).

Clouse fails to teach:

At least one securing element is installed in addition to the, or each, spring element.

Humhauser teaches:

At least one securing element (wire 5) is installed in addition to the, or each, spring element. It would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the vane and seal of Clouse with the securing element as taught by Humhauser because the configuration was known in the art and could have been implemented by one of ordinary skill with predictable results.

In Reference to Claim 18

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Clouse as modified by Schilling and Humhauser teaches:

The damping arrangement according to Claim 17 (see rejection of claim 17 above), wherein the, or each, securing element (5) extends in a circumferential direction laterally next to the, or each, spring element that is configured as a leaf spring (Figure 5).

In Reference to Claim 19

Clouse as modified by Schilling and Humhauser teaches:

The damping arrangement according to Claim 18 (see rejection of claim 18 above), wherein the, or each, securing element is configured as a securing wire (5).

Allowable Subject Matter

10. Claims 20, 30 and 31 are allowed.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN H. ELLIS whose telephone number is (571)270-7414. The examiner can normally be reached on Monday-Friday; 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ED LOOK can be reached on (571)272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RYAN H. ELLIS/
Examiner, Art Unit 3745

/Edward K. Look/
Supervisory Patent Examiner, Art Unit 3745